3.1.7.2 OPERATIONAL CONDITION:

3.1.7.2.1 BIT OUTPUT VOLTAGE: 3.7 VOLTS MINIMUM WITH A 47K OHM LOAD TO GROUND. 5.0 VOLTS MAXIMUM WITH NO LOAD.

3.1.7.2.2 RF LEVEL: BIT MUST INDICATE AN OPERATIONAL CONDITION IF THE OUTPUT VOLTAGE IS ABOVE 0.18 VRMS (-1.9 dBm, 50 OHMS).

3.1.7.3 BIT OUTPUT PROTECTION: BIT OUTPUT MUST OPERATE PROPERLY AFTER BEING SHORTED TO THE SUPPLY VOLTAGES OR GROUND FOR 5 SECONDS WHILE IN EITHER THE FAULT OR OPERATIONAL CONDITION.

3.2 MECHANICAL:

3.2.1 PHYSICAL DIMENSIONS: SHALL BE AS SPECIFIED ON OUTLINE DRAWING. SEE FIGURE 1.

3.2.2 WEIGHT: 7.3 OUNCES (OZ.) MAXIMUM.

3.2.3 CASE TYPE: METAL CAN, HERMETICALLY SEALED.

3.2.4 MATERIAL: MANUFACTURERS STANDARD CAPABLE OF WITHSTANDING THE ENVIRONMENTAL REQUIREMENTS OF 3.3.

3.2.5 FINISH: MANUFACTURER'S STANDARD FINISH CAPABLE OF WITHSTANDING THE ENVIRONMENTAL REQUIREMENTS OF 3.3.

3.2.6 CONNECTORS:

3.2.6.1 RF OUTPUT CONNECTOR SHALL BE HERMETIC, GOLD PLATED, FEMALE SMA PER COLLINS SPECIFICATION 357-0551-010 OR A ROCKWELL APPROVED EQUIVALENT (J1).

3.2.6.2 POWER CONNECTOR SHALL BE HERMETIC, 5-PIN, MALE WITH GOLD PLATED PINS AND NORMAL POLARITY LOCKING HARDWARE PER COLLINS SPECIFICATION 371-2649-020 OR A ROCKWELL APPROVED EQUIVALENT (J2).

3.2.7 MARKINGS: THE UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, MANUFACTURER'S PART NUMBER, FREQUENCY IN MHz (MEGAHERTZ), SERIAL NUMBER AND COLLINS PART NUMBER. THE COLLINS PART NUMBER MUST SHOW THE DRAWING REVISION LETTER. MARKINGS SHALL BE ON THE OPPOSITE SIDE OF OSCILLATOR FROM THE MOUNTING HOLES.

3.2.8 PIN CONNECTIONS:

PIN NO.	FUNCTION
1	A. V_1
2	B. DC AND CASE GND
3	C. BIT OUTPUT
4	D. V_2
5	E. SPARE

3.3 ENVIRONMENTAL: UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF 3.1 AND 3.2 SUBSEQUENT TO THE FOLLOWING ENVIRONMENTAL TESTS. DURING THESE TESTS THE UNITS SPECIFIED NORMAL MOUNTING MEANS SHALL BE USED.

3.3.1

REQUIREMENTS	TEST PARAGRAPH
SHOCK	4.5.1
SALT SPRAY	4.5.3
HERMETIC SEAL	4.5.4
BURN-IN	4.5.5
THERMAL SHOCK	4.5.6
ALTITUDE	4.5.7
MOISTURE RESISTANCE	4.5.8

3.3.2 VIBRATION: DURING THE VIBRATION OF 4.5.2 UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF 3.1 AND 3.2 WITH THE EXCEPTION OF 3.1.4.8, 3.1.6.2, AND 3.1.6.3.

3.3.3 AMBIENT TEMPERATURE: OPERATING: -54°C TO +85°C.
STORAGE: -62°C TO +125°C.

3.3.4 ALTITUDE: OPERATING: -1500 FEET MEAN SEA LEVEL (MSL) TO 80,350 FEET MSL.

3.3.5 NUCLEAR HARDNESS REQUIREMENTS: IN ADDITION TO CONFORMING TO THE ELECTRICAL REQUIREMENTS INITIALLY, THE UNIT SHALL BE CAPABLE OF CONFORMING TO THE REQUIREMENTS OF THIS DRAWING, EXCEPT AS SPECIFIED IN 3.3.5.4, 3.3.5.5 AND 3.3.5.6, AFTER SUBJECTION TO ANY OF THE FOLLOWING NUCLEAR RADIATION LEVELS TESTED AT THE OPTION OF ROCKWELL. REFERENCE 4.5 HEREIN AND COLLINS DRAWING 646-0918-001 WHICH CONTAIN DEFINITION OF THE FOLLOWING LEVELS.

3.3.5.1 TOTAL DOSE: LEVEL E.

3.3.5.2 NEUTRON: LEVEL L.

3.3.5.3 DOSE RATE: LEVEL E.

3.3.5.4 FREQUENCY SHIFT DUE TO RADIATION: ±1.0 X 10^{-7} MAXIMUM.

3.3.5.5 OUTPUT POWER AFTER RADIATION: −3dBm TO +2dBm INTO A 50 OHM ±5% RESISTIVE LOAD.

3.3.5.6 WARM-UP TIME AFTER RADIATION: FROM A SIX HOUR COLD SOAK START AT −40°C, THE FREQUENCY AFTER 5 MINUTES SHALL BE WITHIN 3 X 10^{-8} OF THE FREQUENCY AFTER 30 MINUTES. THE RATE OF CHANGE OF FREQUENCY AFTER 5 MINUTES SHALL NOT EXCEED 1 X 10^{-9}/SECOND.

3.3.6 RADIATION HARDENING (COMPONENT LEVEL): CRYSTAL UNITS SHALL INCORPORATE "SWEPT" QUARTZ MATERIAL.

SEMICONDUCTORS HAVING LOW SURVIVABILITY TO NUCLEAR EXPOSURE SHALL NOT BE INCORPORATED, SUCH AS SCR'S, NMOS, AND SOME CMOS DEVICES.

CURRENT LIMITING SHALL BE INCORPORATED SO AS TO PROTECT SEMICONDUCTORS AND OTHER COMPONENTS FROM NUCLEAR INDUCED PHOTOCURRENT EFFECTS.

3.4 RELIABILITY:

3.4.1 THE MATURE MEAN TIME BETWEEN FAILURE (MTBF) SHALL BE 30,000 HOURS MINIMUM IN AN AIRBORNE UNINHABITED FIGHTER ENVIRONMENT. MTBF SHALL BE DETERMINED USING A ROCKWELL APPROVED PLAN.

4.0 QUALITY ASSURANCE PROVISIONS:

4.1 QUALITY CONFORMANCE INSPECTION: THE SUPPLIERS SHALL BE RESPONSIBLE FOR THOSE IN-PROCESS CONTROLS AND INSPECTIONS NECESSARY TO ACHIEVE A PRODUCT CONSISTENTLY CONFORMING TO THE REQUIREMENTS OF THIS DRAWING. AT A MINIMUM, QUALITY CONFORMANCE INSPECTION SHALL CONFORM TO THE REQUIREMENTS OF MIL-O-55310, GROUPS A, B, AND C. IN ADDITION, GROUP C TESTING SHALL INCLUDE THE FOLLOWING TESTS:

REQUIREMENT	PARAGRAPH
ACCELERATION SENSITIVITY	3.1.4.8
PHASE NOISE DENSITY	3.1.6.3
RESPONSE TO VIBRATION	3.1.6.4

4.1.1 QUALITY CONFORMANCE LOT DEFINITION: A LOT IS DEFINED AS A GROUP OF DEVICES OFFERED FOR INSPECTION, MANUFACTURED WITHIN A 12 WEEK PERIOD USING THE SAME PARTS, MATERIALS, PROCESSES AND DESIGN. THE VENDOR SHALL ESTABLISH TRACEABILITY FROM THE QUALITY CONFORMANCE LOT TO THE PRODUCTION LOT. RESULTS OF THE QUALITY CONFORMANCE LOT WILL BE REVIEWED AND APPROPRIATELY APPLIED TO THE PRODUCTION LOT. A LOT MAY BE BROKEN INTO SUBLOTS TO FACILITATE DELIVERY. SAMPLES FOR QUALITY CONFORMANCE INSPECTION SHALL BE RANDOMLY SELECTED FROM SUBLOTS WHEN PRESENTED FOR QUALITY CONFORMANCE INSPECTION. THE VENDOR SHALL MAINTAIN RECORDS WHICH RELATES THE QUALITY CONFORMANCE GROUP TESTING RESULTS TO THE PRODUCTION LOT AND SUBLOT (BY DATE CODE AND/OR SERIAL NUMBER) WHICH IT SATISFIES. GROUP A AND B SUBLOT SAMPLE TESTS SHALL BE SUCCESSFULLY COMPLETED PRIOR TO SHIPMENT OF THE SUBLOT.

THE VENDOR SHALL PROVIDE TO THE PROCURING ACTIVITY WRITTEN CONFIRMATION THAT GROUP A AND B TESTING HAS BEEN COMPLETED. THE CONFIRMATION SHALL INCLUDE A LIST OF ALL SERIAL NUMBERS THAT CONSTITUTE THE LOT. THE QUANTITY SUBJECTED TO GROUP A AND B TESTING, THE QUANTITY THAT PASSED/FAILED AND STATEMENT OF COMPLIANCE THAT THE LOT PASSED/FAILED THE GROUP A AND B TESTS.

4.1.2 SUPPLIER QUALIFICATION: IN ORDER TO BE AN APPROVED SUPPLIER TO THIS DRAWING, THE SUPPLIER SHALL PROVIDE WRITTEN OBJECTIVE TEST DOCUMENTATION, FOR THE CONFIGURATION BEING SUPPLIED, WHICH DEMONSTRATES COMPLIANCE TO THE REQUIREMENTS OF 3.0 HEREIN. INITIAL QUALIFICATION SHALL CONSIST OF 4.1 AND ADDITIONAL TESTING OR ANALYSIS AS REQUIRED TO VERIFY SUBPARAGRAPHS OF 3.0. THE PROCURING ACTIVITY OF THIS PART RESERVES THE RIGHT TO PERFORM ANY OF THE REQUIRED VERIFICATION TESTS.

4.2 SCREENING REQUIREMENT: SUBSEQUENT TO THE FOLLOWING SCREENING TESTS, PERFORMED IN THE ORDER SHOWN, THE UNITS SHALL BE 100 PERCENT ELECTRICALLY TESTED FOR COMPLIANCE WITH THE REQUIREMENTS LISTED IN TABLE I. TEST DATA SHALL BE SUPPLIED (IDENTIFIED BY SERIAL NUMBER) WITH EACH UNIT DELIVERED.

TEST	PARAGRAPH
BURN-IN	4.5.5
THERMAL SHOCK	4.5.6

4.3 DESIGN CHANGE APPROVAL: ANY CHANGES IN THE FORM, FIT, FUNCTION, MATERIALS OR PERFORMANCE THAT AFFECT THE PART OR MATERIALS DEFINED BY THIS DRAWING MUST BE APPROVED BY THE COGNIZANT PROCURING ACTIVITY PRIOR TO THE INCORPORATION OF THE PROPOSED CHANGES.

4.4 NUCLEAR HARDNESS ASSURANCE REQUIREMENT: DEVICES SUPPLIED TO THIS DRAWING SHALL MEET THE NUCLEAR HARDNESS REQUIREMENT LEVELS SPECIFIED IN COLLINS DRAWING 646-0918-001 AND 3.3.5 HEREIN. THIS DRAWING IS CLASSIFIED AND IS ON FILE AT THE ROCKWELL SECURITY OFFICE. NECESSARY VISIBILITY TO THE CLASSIFIED LEVELS MAY BE OBTAINED BY COORDINATION WITH THE ROCKWELL SECURITY OFFICE.

4.5 TEST PROCEDURES:

4.5.1 SHOCK: UNITS, NON-OPERATING, SHALL BE TESTED IN ACCORDANCE WITH MIL-STD-202, METHOD 213, TEST CONDITION I (100 GRAVITY UNIT'S (G'S), 6 MICROSECONDS (MSEC), SAWTOOTH).

4.5.2 VIBRATION: UNITS, OPERATING, SHALL BE TESTED IN ACCORDANCE WITH MIL-STD-202, METHOD 204, TEST CONDITION G (.06 INCH DOUBLE AMPLITUDE FROM 10-100 Hz, 30 G FROM 100-2000 Hz).

4.5.3 SALT SPRAY: UNITS, NON-OPERATING, SHALL BE TESTED IN ACCORDANCE WITH MIL-STD-202, METHOD 101, TEST CONDITION B.

4.5.4 HERMETIC SEAL: UNITS, NON-OPERATING, SHALL BE TESTED IN ACCORDANCE WITH THE LATEST VERSION OF MIL-STD-202, METHOD 112, TEST CONDITION D.